

**LFC 3000 User's Manual**  
**Series "A"**

**LINCOLN**  
®



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**WARNING**

Failure to adhere to these safety instructions may result in serious bodily injury or death.

**IMPORTANT SAFETY INSTRUCTIONS.**

1. Before installing or using this product, please read the instruction manual thoroughly.
2. Unpacking: Please check that the product is complete and free from any damage.
3. Only qualified individual should install and/or repair this product.
4. Unplug the LFC3000 from the electrical outlet before you clean it.  
Use a damp cloth for cleaning and do not use liquid or aerosol cleaners.
5. Do not place the LFC3000 on an unstable surface that may allow the unit to fall.
6. Never place the LFC3000 near or over a radiator or heat register.
7. Use the type of power source indicated on the label (AC power). If you are not sure of the type of power available, consult your supplier or local electric company.
8. The LFC3000 must be equipped with a plug having a third (grounding) pin, which fits only into a grounding-type outlet. This is a safety feature. LFC3000 should not be used without a properly grounded outlet. Failure to properly ground the LFC3000 may cause damage to the unit or the data stored.

9. Do not put the LFC3000 where the cord will be walked on.
10. An extension cord is not recommended for use with the LFC3000.  
If you use an extension cord, make sure that the total of the ampere ratings on the products plugged into the extension cord does not exceed the extension cord's ampere rating. Also make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.
11. Unplug the LFC3000 from the wall outlet and have it repaired by a qualified service person under the following conditions:
  - A. When the power cord or plug is damaged or frayed.
  - B. If liquid has been spilled into it.
  - C. If it has been exposed to rain or water.
  - D. If it does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and loss of data.
  - E. If it has been dropped or damaged.  
If it exhibits a distinct change in performance, indicating a need for service.

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### DESCRIPTION

The LFC 3000 is a modular fluid management/security system for service workshops. It provides the shop supervisor with a host of services required for precise management of an inventory of products such as oil and antifreeze. The LFC 3000 maintains the inventory by controlling access to hoses, precise metering of the products, and accurate accounting.

A transaction ticket is printed upon completion of all transactions and an inventory report showing all product levels is available to the supervisor.

The LFC 3000 will keep up to 1900 transactions in its protected memory. A transaction historic report keeps track of all the transactions, classified by users, products or hoses.

The modularity of the LFC 3000 makes it adaptable to your existing workshop and upgradable in the future. It is comprised of 1 to 8 I/O modules, 1 to 64 data entry keypads, 1 to 16 optional remote displays and 1 optional PC interface.

The I/O module is the operating intelligence. Each I/O module supports up to 8 counter inputs and controls up to 8 solenoid drivers - this means that the LFC 3000 can operate up to 64 hose reels all simultaneously. One I/O module can communicate with 1 to 8 data entry keypads. The I/O module also supports one additional output for activating or deactivating the main air supply.

The data entry keypad provides access to the system for oil monitoring and dispensing procedures. Configuration of the system is also done from the keypad (for installations without PC). The keypads are all alphanumerical and equipped with a serial port to provide connection to a serial printer.

The remote display has large 56 mm digits to visualize the quantity currently dispensed.

The PC interface is available as an option and offers extended remote transaction memory, computer interfacing and the possibility to control up to 24 I/O units - which means 192 outlets. A complete management software package is supplied with the PC interface. The software is Windows compatible and does not require a dedicated PC.

To initiate a transaction, a personal identification number (PIN) must be entered via the data entry keypad. Any keypad can communicate with any I/O module. A job number, a hose number and the preset amount must be entered. The technician then begins dispensing the product. The amount of product dispensed is displayed on the remote display. When a transaction ends, a transaction ticket is printed on the printer, and the appropriate inventory is reduced by the amount dispensed. Transactions will also end whenever dispensing stops for a certain time period.

The transaction ticket contains all data relevant to the transaction including the job number, the product name, the amount dispensed, the mechanic's name, the hose used, the type of transaction, the time and date and the remaining inventory of the dispensed product.

The LFC 3000 controls up to 64 hoses and can maintain an inventory of up to 8 tanks. The system can be configured for use with pulse meters that are single channel or quadrature (w&m approved).

Access to functions such as configuration and report printing is restricted to different security levels; a supervisor code must be entered before these functions can be used. The supervisor can select the language that will be used throughout the system.

### MEMORY PROTECTED

The LFC 3000 is provided with a battery backed RAM to store up to 1900 completed transactions to guard against data loss in the event of a power failure.

Transaction ticket:	Audit trail of all completed jobs
Stock level:	Stock level of each product tank with minimum stock level
Product delivery:	Details of all deliveries entered into the system, date and quantity - and stock corrections.
Transaction reports:	Product report - usage and totals Hose reports - usage and totals User report - usage and totals All transactions - usage and totals (data retrieved from system memory)
Alarm ticket:	If a high level warning switch is fitted to the waste oil collection tank, a ticket is printed immediately as a warning
Tank low level warning:	When the minimum tank level is reached, a warning ticket is printed
Job report:	Report review by job number for different grades against the same job number and from one date to another (PC level only).
License plate report:	Historic report by license plate number (PC level only)
Configuration:	Keeps track of the system configuration for reconfiguration and after sales service.
Note:	All the above reports are available to be printed except where shown as PC level only. When a PC is incorporated, all reports can be viewed on screen before printing.



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### TECHNICAL DATA

#### Network specifications

The LFC 3000 operates with a CAN Bus network that uses two wires and a shield.

#### System specifications

Keypads on a system	64 max.
I/O modules on a system	8 max.
Solenoid valves on a system	64 max.
Meters with single channel pulse transmitters	64 max.
Fluids on a system	8 max.
Number of operators	99 max.
Transaction log	1900 max.
Simultaneous dispenses	64 max.
Printers per system	64 max.

#### Power supply

The LFC 3000 operates on a 24 VDC voltage.  
A power supply unit is included in the system - Voltage Input  
90-120 Volts AC, 50/60 Hz single phase.

#### Default PIN Numbers

The factory PIN numbers are as follows:

Supervisor Menu.....	9999
Customer Menu.....	1111
System Menu.....	2222

### USER MENU

The user menu is accessible through all the keypads. Only the personal PIN code gives access to this menu.

Enter Pin No.  
\*\*\*\*

Good Morning  
(User's name)

Enter Job No.  
.....

Enter the number of the job, Press ENTER

Enter Reg. No.  
.....

(Optional)

Enter the vehicle plate number (Alphanumeric), Press  
ENTER

Enter Reg. No.  
.....

(Optional)

Enter the vehicle mileage. Press ENTER

Enter Hose  
\_ 0

Enter the hose's number, which corresponds to your request.  
Press ENTER

Product  
(Product's name)

The system confirms the product's name dispensed on the selected hose. Press ENTER

Enter quantity  
6.7

(Optional – Dispense mode: Pre-select or Free dispense)  
Enter the desired quantity. Press ENTER

Dispense product

### SUPERVISOR MENU

The Supervisor menu is accessible through all the keypads by entering the Supervisor PIN Number. Every 45 seconds without use of the keypad, the display shows you the date & time and resets the network. The factory PIN number for the supervisor menu is 9999.

Enter Pin No.  
9999

Good Morning  
Supervisor

Supervisor Menu  
Start / Stop

The selection Start/Stop allows the supervisor to restart the system. ENTER

System State  
Active

ENTER

Supervisor Menu  
Transaction Report

Upon request, the supervisor can print the transaction's reports. These reports will give him precise history of fluids dispensed and totals. All the reports are printed on the report printer as configured in the system configuration menu.

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Transaction reports are available:

By user Report by user (Enter the user's number)  
By hose Report by hose (Enter the hose's number)  
By product Report by product (Enter the product's number)

All transactions All Reports  
Exit

**Supervisor Menu**  
**Delivery Rep.**

LFC 3000 prints a hard copy of all your stock modifications.  
We recommend you to print this report after each product delivery entered in the system.

**Supervisor Menu**  
**Stock Level Rep.**

Prints the stock and the minimum levels for all the configured tanks.

**Supervisor Menu**  
**Product Delivery**

Enter here your new oil deliveries. The new stock will be calculated automatically. Suggestion: Print a delivery report after entering deliveries.

Use Up / Down key to select the desired tank. ENTER

**Supervisor Menu**  
**New Stock Level**

If you want to modify the stock level:

ENTER

**New Stock Level**  
**Tank 1 = 200**

**New Stock Level**  
**300 lts**

**Supervisor Menu**  
**Set Date / Time**

ENTER

**Date 17-05-02**  
**Time 15:09**

In a multi I/O system, this parameter must be the same on each I/O. Every 45 seconds without use of the keypad, the display shows you the date & time and reset the network.

**Supervisor Menu**  
**Set super PIN**

This prompt is used to change the Supervisor PIN Number.  
Only numerical PIN is accepted by the system. If the supervi-

sor PIN Number has been forgotten, it will be necessary to reset the system. See Instruction Manual under Troubleshooting, "Lost Supervisor PIN."

ENTER

**Supervisor pin**  
**9999**

ENTER

**Supervisor Menu**  
**Set super PIN**

ENTER

**Confirm PIN**  
**\*\*\*\***

ENTER

**Confirm PIN**  
**Confirmed**

ENTER

**Supervisor Menu**  
**Clear transactions**

ENTER

We advise you to clear regularly the transactions when you use the system without PC: the transaction's number is limited to 1900. Moreover, when you print the report, you will have the printing of all the transactions since the last "Clear transactions." Answering "Yes" will automatically clear all transactions in the memory of the system. To avoid clearing transactions by mistake, the system is proposing a "No" answer. Using the down arrow will bring the "Yes" answer on the screen.

ENTER

**Clear Transactions**  
**No**

Down  
ENTER

**Are you sure?**  
**No**

Down  
ENTER

Suggestion: print your transaction reports before clearing transactions.

**Supervisor Menu**  
Add New User

Up to 99 users can be stored in the system. Any 4 digit PIN numbers can be assigned to an operator. It is recommended that the supervisor keep a list of the PIN numbers in case he needs to remove one of them. Two users cannot have the same PIN Number.

ENTER

New User Pin  
\*\*\*\*

ENTER

New User Name  
(User name)

ENTER

New User Name  
User added

**Supervisor Menu**  
Remove User

ENTER

Enter Ex-PIN  
\*\*\*\*

ENTER

Enter Ex-PIN  
User deleted

The user will be deleted from the system.

**Supervisor Menu**  
Customer Config.

ENTER

Customer cfg. PIN  
1111

Access to the customer security level. Factory PIN number for customer menu is 1111.

**Supervisor Menu**  
Exit

ENTER

Return to User Screen

## CUSTOMER MENU

The Customer Configure Menu is accessible through all the keypads. At the initialization of the system or when modifications are done on this menu, the data is automatically updated at the other keypads through the network. It is not necessary to configure all the keypads separately.

**Customer Menu**  
Products

All the fluids controlled by the system can be identified in alphanumerical characters. In certain installations, the same product can be pumped from different tanks (maximum 8 tanks). The LFC 3000 allows you to manage these tanks separately to control their respective stock level. Assign the tank from which the product will be pumped.

Enter  
Tank Number 1

Enter the tank number  
ENTER

Product 1  
Motor Oil

Use Up / Down key to select the product number

ENTER

Enter the product's identification by using the alphanumeric keypad

ENTER

The system goes back to the prompt "Products"

**Customer Menu**  
Hose

All your dispensing points (hoses) must be linked to the tank it is dispensing from.

ENTER

Enter Hose  
01

Enter the hose number  
ENTER

Enter Tank  
01

Enter the tank number  
ENTER

The system will confirm the name of the product configured for verification;

Select Product  
Motor Oil

ENTER  
Enter hose "00" to exit

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### Customer Menu Warn Level

A minimum stock level must be set for each tank. All fluids dispenses will automatically be deducted from the respective tank stock. When the stock level in the tank reaches the warning level, a warning reordering message will automatically be printed on the report printer.

ENTER

Use Up / Down arrow key to select the tank

### Warn Level Tank 1 = \_\_\_\_\_

ENTER

### Warn Level \_\_\_\_\_ 0

Enter the minimum stock level

ENTER

### Warn Level 400

### Customer Menu Stop Level

In addition to the "minimum level", the LCF 3000 offers the ability to set up "stop levels" for each tank, preventing dispenses of the selected product when the level in the tank is under the stop level limit. This will prevent air to enter in the oil line and prevent any risk of impurities entering the line as well.

ENTER

### Stop Level Tank 1 = \_\_\_\_\_ 0

Choose the tank you want to configure.

ENTER

### New Stop Level \_\_\_\_\_ 0

### Customer Menu Dispense Mode

The LFC 3000 offers the possibility for the operator to dispense oil in Pre-Select or in free dispense mode. In Pre-select mode, the system will not authorize any dispense without a pre-selected quantity of fluid. In free dispense, the system will authorize dispenses without pre-selection of any quantity.

The system will close the transaction when the inactive time-out has been reached.

ENTER

Use Up / Down key to select the mode.

### Dispense Mode Pre-Select - Free Dispense

### Customer Menu Odometer & Reg.

With the LFC 3000 you can store the odometer reading and the license plate number of the vehicles maintained in the garage. This information will appear on the transaction ticket;

ENTER

### Odometer & Reg. Yes

Use Up / Down keys to select

The keypad will always ask the operator to store the odometer and registration plate of the vehicle corresponding to the job number.

### Odometer & Reg. No

The function will not be activated.

### Customer Menu Initial Timeout

The initial time-out is the time between the validation of the transaction data's on the keypad and the opening of the solenoid valve corresponding to the selected hose. Enter the maximum number of seconds necessary before starting the operation.

**In a multi I/O system without PC, this parameter must programmed and be the same and on each I/O.**

ENTER

### Initial Timeout 06

### Customer Menu Inactive Timeout

The inactive timeout is the period between the last pulse received by the system and the closing of the solenoid. The LFC 3000 will close the transaction if the time between 2 pulses reaches the inactive-time configured in the system. It is visualized that the operator has started to fill the vehicle with oil and that he has stopped the dispense before the pre-set quantity has been reached or because he is working in the free dispense mode. When choosing this duration, bear in mind that this should be long enough for your worker to verify the oil level on the dip stick. Enter the maximum number of seconds needed.



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Inactive Timeout  
120

System Cfg PIN  
2222

In a multi I/O system without PC, this parameter must be programmed and must be the same on each I/O.

Customer Menu  
Set Language

Customer Menu  
Exit

ENTER

Use Up / Down key to select the language.  
LFC 3000 is a multi language system. The default language is British English.  
To change to American English, you must enter US0011. This will also change the unit of measurement from liters to quarts.

Customer Menu  
Set Customer PIN

This prompt is used to change the Customer PIN number. Only numerical PIN is accepted by the system.

If the Customer PIN has been forgotten, it will be necessary to reset the system and re-configure. See Instruction Manual, under Troubleshooting, "Lost Supervisor Pin."

ENTER

Customer Cfg PIN  
\*\*\*\*

ENTER

Confirm PIN  
\*\*\*\*

Confirm PIN  
Confirmed

System Menu  
Diagnostics

As a support for the installer and after sales services, LFC 3000 provides a diagnostic report:

- the configuration for the installation parameters
- the names of the products
- the number of the users, their names and their PIN codes
- the hoses, tanks, product's names, displays and corrections factors

We advise you to print this diagnostic after each installation.

Customer Menu  
Configure System

ENTER

System Menu  
Test Mode

ENTER

Use Up / Down key to select the test.

-**Test A:** test the opening/closing for each solenoid.

The test A from a keypad is only valid for the solenoid valves connected on the I/O unit communicating with this keypad.

-**Test B:** factory use only

-**Test C:** test to confirm the address of each large character remote display

display address 0: random figures

display address 1: figures 000.1

display address 2: figures 000.2

Etc...

-**FLT FLT FLT FLT or OK OK OK OK:** this test is only valid for quadrature pulsers.

You have the possibility to test a maximum of 4 quadrature pulsers connected on the I/O Unit.

The position of the message indicates where the position of the pulser is.

An OK message indicates that the quadrature pulser is not connected.

If you connect single pulsers, a FLT message will appear.

-**none**

System Menu  
Display Allocation

The LFC 3000 offers the use of remote displays for an easy visualization of the oil dispensed by the worker. This screen allows you to program in the system on which display the worker wants to visualize his dispenses. One display can be used for multi hose reels.

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Every display is delivered with dip switches on the PC board. See Instruction Manual, "Wiring the display."

ENTER

Select Hose  
01

ENTER

Select Display  
00

ENTER

Hose Number 1 will be visualized on display Number 00.

System Menu  
Set Encoder Type

LFC 3000 allows the use of single channel and dual channels pulse transmitters.

By default, all the systems are programmed to be used with single channel pulse transmitters.

ENTER

Set Encoder type  
Quadrature

Quadrature corresponds to dual channel pulse transmitter.  
Use Up / Down keys to select.

Set Encoder type  
Single Channel

Single channel pulse transmitter.

**In a multi I/O system without PC, this parameter must be programmed and be the same on each I/O.**

ENTER

System Menu  
System Type

System Type  
Non-Master

Use Up / Down keys to select.

Non-Master is used without PC.

Master is used with PC.

ENTER

System Menu  
Set Report Adr.

A "Main" printer is necessary to print the entire statistic, stock level reports and diagnostic.

This printer must be 80 columns; Epson emulated with a serial port.

The factory default setting is report address on Keypad 0.  
ENTER

Report Address  
I/O Control

ENTER: The report printer is connected to an I/O unit (ID=0). Use Up / Down key to select

Report Address  
Keypad x

ENTER: The report printer is connected on the keypad number X.

Use Up / Down key to select until you have the correct address.

ENTER

Report Address  
None

ENTER: There is no report printer on the system.  
Use Up/Down keys to select.

ENTER

System Menu  
Set Ticket A Addr.

To fulfill all the needs of the garage supervisors, LFC 3000 offers the flexibility to print the transaction tickets on different printers. All the printers must be connected through the serial port and be Epson emulated. This instruction must be done on EACH keypad.

The Factory default setting is Ticket A address on Keypad 0.  
ENTER

Ticket A Address  
I/O Control Unit

ENTER: The ticket A printer is connected on the I/O unit (ID=0)  
Use Up / Down keys to select.

Ticket A Address  
Keypad X

ENTER: The ticket A printer is connected on the keypad number X.  
Use Up/Down key to select the address.

ENTER

Ticket A Address  
None

ENTER: There is no ticket A printer on the system.  
Use Up/Down keys to select.

ENTER



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System Menu  
Set Ticket B Adr.

To fulfill all the needs of the garage supervisor, LFC 3000 offers also the flexibility to print a copy of the transaction tickets. All the printers must be connected through the serial port and be Epson emulated. This printer can be the main printer. This instruction must be done on EACH keypad. The factory default setting is ticket B address on keypad 0.

Ticket B Address  
I/O Control Unit

ENTER: The ticket B printer is connected on the I/O unit (ID=0)  
Use Up / down keys to select.

Ticket B Address  
None

ENTER: There is no ticket B printer on the system.  
Use Up / Down keys to select

Ticket B Address  
Keypad x

ENTER: The ticket B printer is connected on the keypad Number x.  
Use Up / Down keys to select the address  
ENTER

System Menu  
Set System PIN

The system PIN code can be modified. Only numerical PIN is accepted by the system. If the system PIN Number has been forgotten, it will be necessary to reset the system and re-configure. See Instruction Manual, under Troubleshooting, "Lost Supervisor PIN."

ENTER

System Cfg PIN  
\*\*\*\*

LFC 3000 operates all the hose reels simultaneously or one hose reel at a time. When the system is configured in simultaneous mode, you will be able to dispense on all the different hoses at the same time.

The factory default setting is simultaneous.

System Menu  
Set Simultaneous Mode

ENTER

Set Simultaneous Mode  
Non-Simultaneous

Use Up / down keys to select.

Set Simultaneous Mode  
Simultaneous

In a multi I/O system without PC, this parameter must programmed and must be the same on each I/O  
ENTER

System Menu  
Pulses per Liter

LFC 3000 is designed to register pulses from 1 to 255 per liter. Refer to the type of pulse transmitter. To change to "pulses per quart" see user menu, "Set Language", change to American English.

Pulse per Liter  
100

In a multi I/O system without PC, this parameter must programmed and be the same and on each I/O.  
ENTER

System Menu  
Max. Dispense

ENTER

Select Hose  
0

Max. Dispense  
— 100

ENTER the maximum quantity that will be allowed to be dispensing on the selected hose.  
Then press ENTER and do the same for the other hoses.

System Menu  
Decimal Place

Decimal Place  
1

You can choose the place of the decimal. You only have 1 or 2 (use the Up / down arrow key).  
( You also have to change physically the jumper located in the display). ENTER

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System Menu  
Hose Calibration

This prompt is offering the possibility to correct the delay of the solenoid valve shut-off.

When an operator presets a quantity of fluid to be dispensed, the system will automatically close the solenoid valve when the preset quantity has been reached. The LFC 3000 counts the pulses coming from the pulse transmitter. Assuming that the pulse transmitter type is 100 pulses per liter, the calibration procedure will be as follows;

Preset quantity: 4 liters = 400 pulses  
Quantity dispensed: 4.1 lit. = 410 pulses  
Difference: 0.1 lit. = 10 pulses

10 will be the calibration factor to enter in the system.  
ENTER

Select Hose  
01

ENTER

Pulse count  
10

ENTER

System Menu  
Change I/O ID

By default all the I/O units have the same address (ID) Number 0 corresponding to solenoid drivers (hose reels) 1 to 8. For the installation with multi I/O units (more than 8 hoses), each I/O must have its own address to be identified by the network.

Power up each I/O successively and change their address. For example ID Number 1 for solenoid drivers (hose reels) 9 to 16.  
ENTER

Changer ID I/O  
From 0 to 1

ENTER

The network communicates now with this I/O unit 1 for hoses 9 to 16.

System Menu  
Exit

ENTER

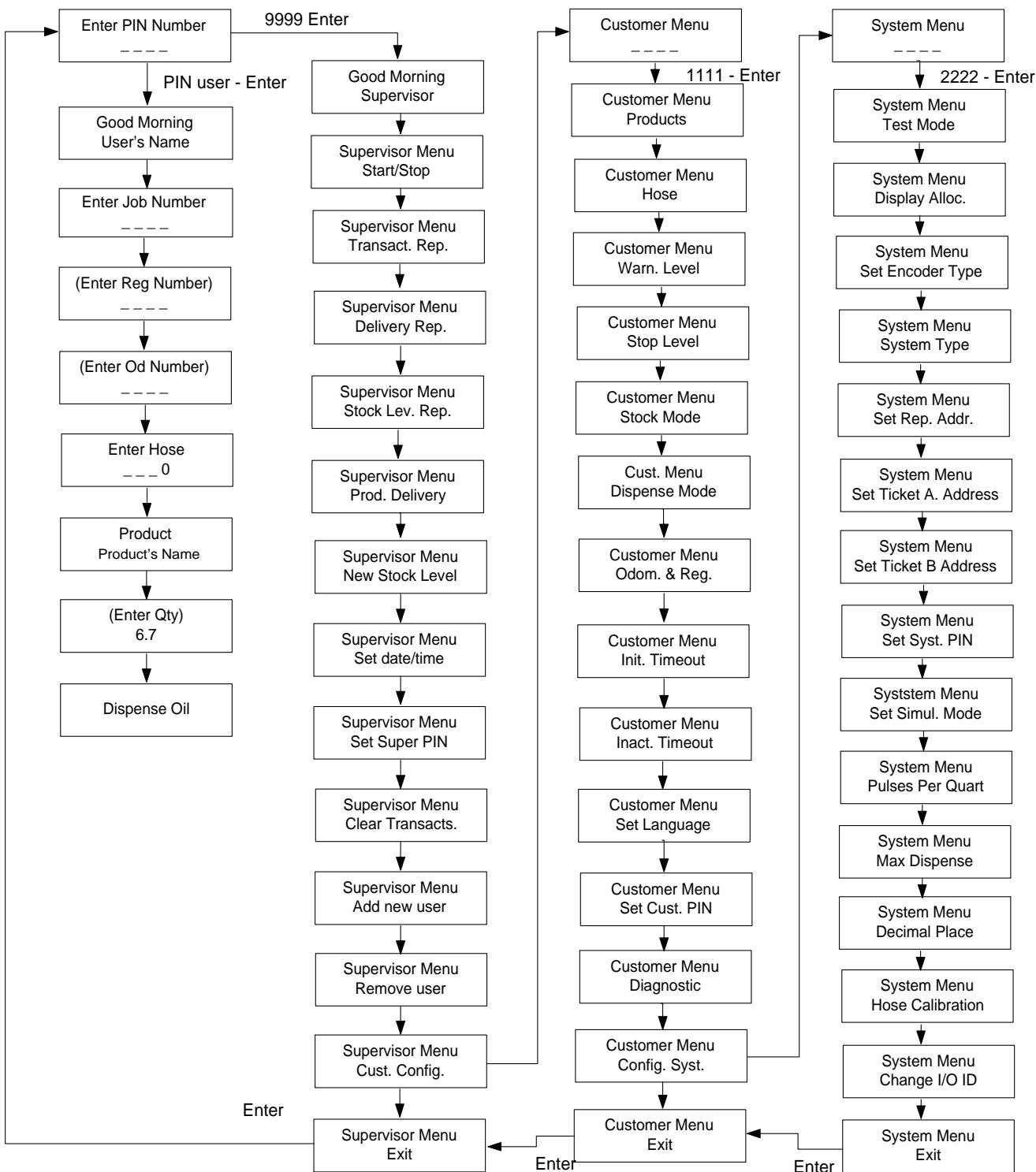
Return to Customer Configure Menu at the exit prompt. To return to the User screen, press twice ENTER.

## TRANSACTION CODES

Explanations for the transaction end codes printed on each transaction ticket:

- 0 Means that the transaction has been stopped after the inactive Timeout:
  - it's normal in free dispense mode
  - The preset quantity has not been totally dispensed
- 1 In preselect mode, the preset quantity has been totally dispensed: Completed
- 2 Input Error in the pulses sequence: for quadrature pulsers only
- 3 Count Error: missing pulse in quadrature pulsers only
- 4 It means that the power has been shut down during the transaction: Power down
- 5 The transaction has been stopped by the emergency procedure (...): System inactive
- 6 IOP Error: Microprocessor Error
- 7 Unauthorized transaction: for approved systems only, quantity dispensed between 0.5Lt and 100Lt.

### FLOW CHART



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